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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/588,606 | 08/07/2006 | Tooru Yukimoto | 5173-0102PUS1 | 8367 |
| 2292 | 7590 | 11/05/2008 | EXAMINER | |
| BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747 | | | | ALI, MOHAMMAD M |
| ART UNIT | | PAPER NUMBER | | |
| 3744 | | | | |
| NOTIFICATION DATE | | | DELIVERY MODE | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/588,606 | YUKIMOTO, TOORU | |
| | Examiner | Art Unit | |
| | MOHAMMAD M. ALI | 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 07 August 2008.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-3 and 5-21 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-3 and 5-21 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 07 August 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>05/15/08 and 08/29/08</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “turbulent portion formed in inner wall surface of each of the valve chambers” for claims 3 and 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

Claims 3 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such

omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: The turbulent portion is formed in an inner wall surface of each of the valve chambers.

Claim Objections

Claims 14, 20 and 21 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Double Patenting

Claim 11, 17 objected to under 37 CFR 1.75 as being a substantial duplicate of claims 10, 15 respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 7-12, 14, 15-20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Umeda et al., (JP 2001-12825 A). Umeda et al., disclose an expansion valve for arrangement in a refrigerant circuit of a refrigerating apparatus, the expansion valve comprising:

a valve chamber (8); an inlet, formed in the valve chamber (8) and connected to an upstream refrigerant pipe (10), for drawing a refrigerant flow into the valve chamber (8); an outlet, formed in the valve chamber (8) and connected to a downstream refrigerant pipe (11), for discharging the refrigerant flow from the valve chamber (8); a refrigerant passage formed between the inlet and outlet in the valve chamber (8); an orifice (9) for variably controlling the flow rate of the refrigerant flow in the refrigerant passage; and a turbulent portion formed in the inner surface of the valve chamber (the groove 3 and 3" (see Fig 16) formed at the stop surface 12c of the valve chamber formed , the outer meandering surface of the valve portion, the sharp corners formed on the outer surface of the valve portion, sharp corners formed on the inner surface of the valve body , meandering surface formed on the inner surface of the valve case 4 (se Fig.s 1, 2, 4-6) including an axial and oblique (see inner surface of valve casing 4 in (Figs 1-2, 4-6) passage, are causing turbulence in the refrigerant flow in the refrigerant passage upstream of the orifice and protruding top seat surface 12c , tapered surface 6d are causing turbulent flow downstream of the .valve chamber 8. Regarding ridges and valleys can be seen on the inner surface of the valve casing 4 and also on the outer surface of the valve portion; wherein the valve element has a distal end having a needle valve. See Figs. 1, 2, 4, 8, 10, 12 and 16.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umeda et al., in view of Tanasawa et al., (4,365,746). Umeda et al., disclose the invention substantially as claimed as stated above except spiral groove. Tanasawa et al., teach the use of spiral groove 14 on the valve surface 13 of valve for the purpose of obtaining swirling or turbulent flow of fluid . See Fig. 4 and 5, column 2, lines 31-39. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the valve groove 3 of Umeda et al., in view of Tanasawa et al., such that a spiral groove can be provided in order to obtain turbulent flow..

Claim 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umeda et al., in view of Takai (US 6,902,379). Umeda et al., disclose the invention

substantially as claimed as stated above except spiral groove in the valve surface or with the surface of the valve chamber in both the upper and lower valve chamber disposed upstream and down stream of the valve seat. Takai teaches the use of spiral grooves 205C and 204C disposed on the valve surface located in the valve chamber both upstream and down stream of the valve seat (See valve seat under valve 5 in Fig. 2); Takai further discloses similar spiral grooves with the internal surface of upper and lower valve chambers 7a, 1c (see column 8, lines 9-22) for the purpose of maintaining smooth operations of the valve rod 205b and 204. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the valve groove 3 of Umeda et al., in view of Takai such that a spiral groove can be provided in order to obtain smooth operation of refrigerant circuit.. The grooves/fins being spiral a turbulent refrigerant flow is inherent in a spiral groove. For evidentiary reference, see column 2, lines 49-57 of US Patent 2,592,712 to M. F. Knoy.

Response to Arguments

Applicant's arguments filed 08/07/08 have been fully considered but they are not persuasive. With respect to the drawing objection the Applicant given an example of Fig. 2 . Figure two does not conform to claims 3 and 13 as the Fig. 2 lacks the turbulent portion in the valve chamber downstream of the valve seat.

The applicant argued that step surface 12d does not create turbulence within the passage upstream of the valve port. The examiner disagrees. Any small gap created at the flow of high pressure refrigerant creates turbulent flow by acting as a nozzle. For evidentiary reference see column 1, lines 31-36 of US Patent 6,898,945 B1 to Grove. It

is also a common sense that any obstruction on the flow path of a high pressure refrigerant makes the flow turbulent. Therefore, the argument of the Applicant is not correct and the rejections are ok. However, for clear understanding a further non-final has been made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD M. ALI whose telephone number is (571)272-4806. The examiner can normally be reached on maxiflex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4808. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad M Ali/
Primary Examiner, Art Unit 3744

Application/Control Number: 10/588,606
Art Unit: 3744

Page 8